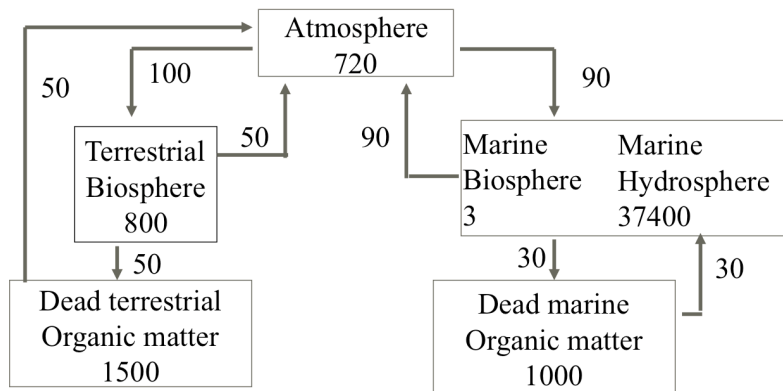


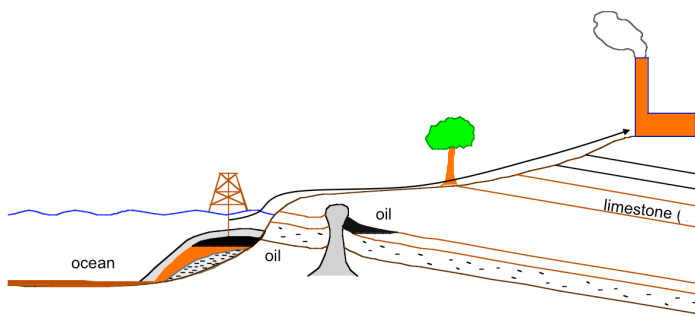
Final exam SS10

1. When my house gets too warm, the thermostat turns off the furnace. When my house gets too cold, the thermostat turns on the furnace.
This is an example of
 - a. positive feedback
 - b. negative**
 - c. stasis
2. When water freezes
 - a. water molecules become more dense
 - b. water molecules become less dense
 - c. water molecules stop vibrating
 - d. water molecules are further apart**
3. Suppose all the glaciers melt. Ten thousand years later, most of the water from those glaciers would be in
 - a. lakes and streams
 - b. ground water
 - c. the atmosphere
 - d. the ocean**
4. At which of boundary is magma least likely to form
 - a. ocean-ocean convergent
 - b. ocean-continent convergent
 - c. continent-continent convergent**
 - d. ocean-ocean divergent
5. If the equatorial areas become warmer by 5 degrees and the polar regions become colder by 5 degrees, thermohaline circulation will become
 - a. stronger**
 - b. weaker
 - c. remain the same
6. Which of the following contains the least amount of carbon in the load of rivers
 - a. bedload**
 - b. suspended load
 - c. dissolved load



7. Based on the box and arrow diagram above, which reservoir(s) would have a residence time between 20 and 100 years.
 - a. all except the marine hydrosphere
 - b. the terrestrial biosphere
 - c. dead terrestrial organic matter**
 - d. both dead marine and the atmosphere
8. Imagine a world in which there are no organisms. In this world the calcium ions that enter sea water would leave the reservoir by
 - a. evaporation
 - b. settling to the bottom of the sea
 - c. chemical precipitation**

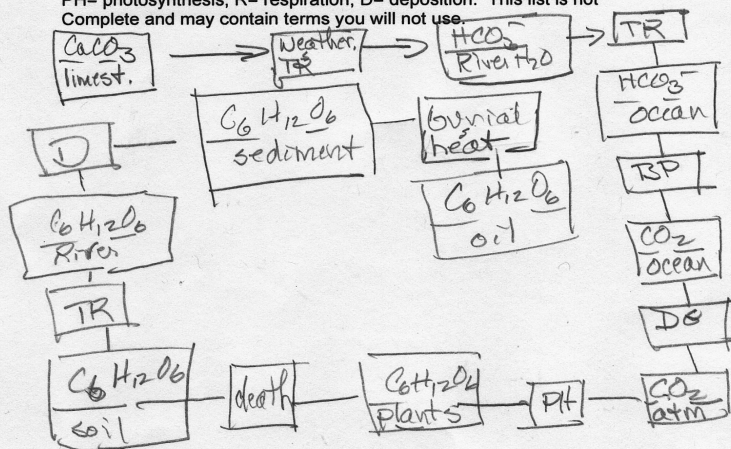
9. The residence time of calcium in the oceans is approximately 1.2 million years. One impact of global warming is that reef growth may slow. This would
 - a. **decrease the residence time of calcium in the ocean**
 - b. increase the residence time of calcium in the oceans
 - c. not change the residence time of calcium in the oceans
10. There are many groups that use and consume water. Which of these is the largest consumer of water.
 - a. heavy industry
 - b. municipalities
 - c. **agriculture**
 - d. energy industry
11. As carbon dioxide levels in the atmosphere rise, which of the following will increase directly?
 - a. **calcium silicate weathering**
 - b. biochemical precipitation
 - c. metamorphic degassing
12. Scientists predict that global warming will lead to
 - a. **more intense hurricanes**
 - b. more hurricanes
 - c. more hurricanes but the hurricanes will be less intense
13. If an ice cube melts, the water evaporates and vapor then condenses, the following changes in energy occurred.
 - a. Energy was released when the bonds in the ice broke, gravitation energy was used to evaporate the water and energy was used to form bonds during condensation.
 - b. Energy was used when the bonds in the ice broke, gravitation energy was used to evaporate the water and energy was released when during condensation.
 - c. **Energy was used when the bonds in the ice broke, thermal energy was used to evaporate the water and energy was released when during condensation.**
 - d. Energy was released when the bonds in the ice broke, gravitation energy was used to evaporate the water and energy was released when during condensation.
14. One approach to ethics suggests that the interlocking relationships of society are the basis of ethical reasoning and that respect and compassion for all others-especially the vulnerable-are requirements of such reasoning. This approach also calls attention to the conditions that are important to the welfare of everyone. This may be a system of laws, effective police and fire departments, health care, a public educational system, or even public recreational areas. This approach is called
 - a. fairness and justice
 - b. rights
 - c. utilitarian
 - d. **common good**
 - d. virtue
15. Everyone will get 2 points for answering this question.
If this class were a regular lecture class, I would have
 - a. **learned more**
 - b. **learned less**
 - c. **learned about the same**



Use this figure to answer short answer question 1.

THERE ARE 5 SHORT ANSWER QUESTIONS

1. Based on the sketch above, draw a box and arrow diagram showing reservoirs and process as carbon moves from the limestone to the oil in the ground. To keep your diagrams neat- please use these abbreviations if need. TR= transportation, BP= biochemical precipitation, DG= degassing PH= photosynthesis, R= respiration, D= deposition. This list is not complete and may contain terms you will not use.



2 a. Subduction is similar to... *a cold air mass descending beneath warmer air*
because... *both occur because a more dense material is sinking*

b. Formation a solid compound from ions in a magma and condensation are similar because... *in both cases reducing temperature allow bond to form*

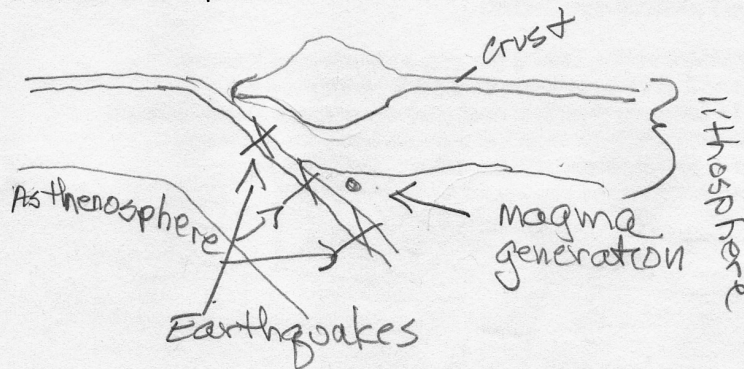
c. Degassing of CO₂ from the oceans is similar to... *evaporation*
because... *increasing temperature increases degassing & evaporation*

3. When a hurricane moves over colder water it decreases in intensity because...

the hurricane loses its source of energy, water vapor that forms by evaporating ocean water. The energy is released when the vapor condenses.

4. Draw an ocean-continent convergent plate boundary and label the following (25 pts)

- a. crust, b. lithosphere, c. asthenosphere d. location of magma generation
e. location of earthquakes



5. Imagine that humans had burned all the available coal oil and natural gas by the year 2300. In 10520 humans worried that a cooling trend was leading them into a new ice-age. How might they geoengineer the climate to avoid a new ice age? Answer in less than 50 words.

Add CO_2 to the atmosphere by artificially metamorphosing CaCO_3 + silica to form CaSiO_3 + H_2O + CO_2 gas. This CO_2 gas would increase the greenhouse effect.